4-9-03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Thomas L. Barkley et al : GROUP ART UNIT: 3641

SERIAL NO: 09/863,795 :

FILING DATE: May 23, 2001 : EXAMINER: P. Nelson

TITLE: DETONATING CORD AND METHODS OF MAKING AND USING THE SAME : ATTY DKT: P-1659-1

RESPONSE TO OFFICE ACTION

Commissioner of Patents
Washington, DC 20231

March 28, 2003

Dear Sir:

INTRODUCTORY COMMENTS

This paper is responsive to the office action mailed September 30, 2002 in the captioned application, in which claims 1-28 have been variously rejected under 35 U.S.C. 102 and/or 35 U.S.C. 103.

Before discussing the office action in detail, it is useful to briefly describe the present invention.

Background

Detonating cord is of course well-known in the art and comprises a solid core of high explosive encased in a protective jacket. The solid core of high explosive is usually made of a compressed pulverulent explosive such as PETN, although other explosives may be used, and exhibits a velocity of detonation (the speed at which the explosive front travels linearly along the cord) on the order of about 6,500 to 7,500 meters per second. As explained at page 1, line 27 et seq. of Applicants' specification, the explosive core is compressed in order to increase and standardize its density because the velocity of detonation, and thereby the explosive energy output, is proportional to the density of the explosive core. Usually, increased explosive output per unit length of cord is desired.

The Invention

As stated in the Summary of the Invention starting at page 4, line 20 of Applicants' specification, although a high explosive output for a given diameter of detonating cord is usually desired[1], the Applicants have discovered that under certain circumstances it is desirable to reduce the velocity of detonation. It has been found that doing so will reduce the peak output shock wave pressure caused by detonation of the detonating cord. This is advantageous, for example, as pointed out starting at page 3, line 28 of Applicants' specification, in quarrying operations and in the dimension stone industry. High peak energy outputs have been found to result in excessive spalling and cracking, thereby reducing the yield of usable stone. This is a particular problem in the dimension stone industry, which is concerned with cutting from rock formations blocks of construction and memorial stone. The Applicants alone have recognized that (1) introduction of a specified class of diluent into the solid explosive core of the detonating cord reduces the velocity of detonation, and (2) that this reduction is desirable in certain applications. The class of diluents is defined in the amended claims. Specific examples of diluents are glass or resin microballoons or very fine plastic or glass beads, or an explosive of lower velocity of detonation than the first explosive, or a combination of two or more thereof. See page 5, line 7 et seq. of Applicants' specification.

[1] This is noted at page 8, lines 7-10 of Applicants' specification.